B H Swales
July 3-0

THE

WILSON BULLETIN

A QUARTERLY JOURNAL OF
ORNITHOLOGY

VOL. IX. JUNE, 1902. NO. 2.

BIRD STUDIES IN LORAIN COUNTY, OHIO.

WINTER STUDIES.

BY LYNDS JONES.

There is a fascination about the study of the hardy birds who brave the winter's dangers and discomforts, which no other season of the year affords. We feel not only gratitude but a sort of kinship to these our brothers in feathers who seem to refuse the comforts of winter tropics that we may not be left wholly deserted in the ice and snow for three long months. We must feel a certain respect for them, too, when we reflect that they have never a fire to warm them and to soften their frozen food. Theirs is a constant battle with the cold. The sun is their only fireside.

The study of birds in winter, if one studies them under all conditions, is pretty sure to be attended with discomforts at times. But if we dress for the work it serves rather to increase our love for the season in what it brings of increased capacity for work, than dread for it. There is a sense of being superior to the weather, whatever the temperature, which is exhilarating and invigorating. We ought to feel the better in health for breathing air from which the moisture has been well frozen out.

Winter gives up many secrets of the birds which must otherwise be always hidden from us. It would be rare indeed that the birds which walk much should write their activities so we could read them, without snow. But about what can be read from bird tracks we are not concerned in this paper. At no other time of year do the purely social instincts of the birds show themselves so well, and can be read so easily. Birds are far more approachable than at any other time except when nesting. The nesting season, however, presents the other side of the bird nature—the egoistic or the family life as distinct from the social life. But it is not about this side of the winter study that I wish to speak now. Rather let us first see what and how many birds there are about us during the winter months.

In the deductions which follow it must be understood that they are based upon strictly winter records. Generally that means December, January and February; but sometimes winter did not begin until mid-December, and sometimes it ended a week or more before the close of February. In only one instance did it begin in November and in only one extend into March. It is comparatively easy to determine the end of winter by the appearance of the first migrant birds, but it is often difficult to know at what time the winter begins. In every case of doubt the record has been thrown out.

The work upon which this paper is based began in 1896, and has been carried on uninterruptedly every winter since. After a very little experiment it became apparent that the plan to make a complete census of even a quarter of the county was impracticable. Consequently several representative regions were selected and these were as thoroughly worked as possible. The accompanying map of a part of Lorain county will serve to show the general outlines of the ground covered. No. 1, may be known as the Chance Creek route; No. 2, Beaver Creek route; No. 3, north overland route; No. 4, Oberlin south-east route; No. 5, Oberlin north-east route. Of course other parts of the county were traversed and

studied, but far less thoroughly than these. Furthermore, the records for these five routes are so nearly the same as regards number of trips and time spent on each trip, that a fairly reliable comparison may be drawn.

Route No. 1, represents the sand-stone knoll and Chance Creek gorge region of the county, where coniferous trees are much in evidence, and where vegetation is allowed to have its own way largely, thus affording the best possible covers in severe weather. The lake shore part of this route and of the two following ones overlap somewhat and the records for the lake have been kept distinct from the inland parts of the routes. Route No. 2, is distinctively a stream gorge route, and represents scarcely anything but the Beaver Creek fauna. It is a rich fauna. Route No. 3, is just as distinctly an overland field and woods route with no stream gorge anywhere, because no considerable stream is crossed. Route No. 4, and 5, represent the field and woods region bordering the shallow gorge of the west branch of Black River. They are somewhat different, both including some of the deeper woods of this part of the county. These five routes are fairly representative of the county, at least west of the west branch of Black River and the main part of the river from Elyria to the lake.

Oberlin, the focus of these five routes and always the starting point for the day's work, lies in a plane region 250 feet above Lake Erie. Into this plane region the streams have cut their winding courses, each from a pattern of its own. Black River and its tributaries, above the junction of the east and west branches, has formed a shallow and broad gorge, in which abandoned channels have formed long narrow marshes or lagoons with more or less heavily timbered borders. Here the pawpaws flourish, forming thickets for the winter sparrows. The whole course of this stream and its principal tributaries is fringed with sycamore trees of considerable size. Wild grapes and the bitter sweet are not numerous here, but many apple orchards bordering or

wholly within the wide gorge, afford feeding grounds for many winter birds.

Chance Creek, a tributary of Vermillion River, forms a strong contrast to the river just described. Its gorge is narrow and deep, with heavily timbered, almost precipitous slopes. The more level borders of this gorge are timbered with hickory and oak, a few beach trees, besides others, and a bountiful supply of wild grapes and the bitter sweet. Orchards also border the gorge, alternating with cultivated fields. The gorge itself is plentifully supplied with red and white cedars and hemlocks, besides many species of deciduous trees. Here evergreen timber, tortuous course, and 100 feet depth combine to form an ideal protection from any winter blast. Food, also, is abundant. The many sheer precipices exposed to the sun's heat, afford snowless retreats in the worst storms. The remainder of this route to the lake shore lies across open fields and upland woods over the sandstone knolls and deserted quarries where no attempt is made to hinder the rank and tangling vegetation. No better winter residence could be imagined for the thicket-loving birds than these tangles. One cannot beat through them. Persuasion is the only successful method of dealing with the birds here.

Beaver Creek presents the characters of Black River in its upper and lower reaches, but modified Chance Creek characters along its middle third. Here one finds two small hemlock groves which afford shelter for the hawks and owls. Crows also winter here. Food seems to be abundant everywhere. A day spent along its course is sure to bring surprises.

The uplands of the county, or the parts of it studied, are a succession of four fairly level terraces to the lake shore. Except along the course of the old lake beaches the country is about three-fourths cultivated fields to one-fourth woodland. The woods are, generally speaking, the remnants of the original forest which occupy land hardly fit for the plow if it were cleared. It is either swampy, or too thin soil.

That is not true of all the woodland, however. The courses of the old lake beaches are untillable, in places, and in such places are a wild tangle of trees, bushes and vines, into many of which even the cattle are unable to penetrate. Seeds, berries and grapes abound. These stony old beaches vary in width from a few rods to many rods.

The lake shore is bordered by high clay banks except where the streams have cut an exit. The back water from the lake has caused these channels, which seem to have been considerably deeper in former times, to partially fill with wash, thus forming bogs and swamps of various sizes and considerable length, which are now largely overgrown with wild rose, a species of water willow and alder bushes, in some places forming impenetrable thickets. The annual plants grow here in bewildering profusion and astonishing rankness. This is the favorite winter retreat of Song Sparrows. The woods which border the swamp at Oak Point, the mouth of Beaver Creek, harbor the most of our woods-haunting winter species. It is second only to the stream gorges in the richness of its population.

The lake and its immediate shore furnish scarcely more than the water birds. Usually the Short eared Owl may be found hiding underneath the overhanging banks, and not infrequently Snowflakes are found on the sand or upon the railroad track which lies close by. An occasional Crow, and one flock of seven Bob-whites are found here, making their records in the sand. Late in the winter the lake shore is a pretty frigid region, and a good deal of a wilderness. Its ice-covered surface affords no feeding places for gulls and ducks.

The work of recording the species and individuals consisted simply in walking over the same ground, time after time, recording the individuals of each species as they were seen. It is usually possible to count the individuals. Even the large companies of Tree Sparrows can be made to pass a given point leisurely enough to make an accurate count possible. There is some complication, to be sure, when Jun-

coes, Song Sparrows and Goldfinches are also a part of the company. But in such a case the species of fewer individuals should first be counted and recorded, and lastly the whole company counted. Subtraction will then give the number of Tree Sparrows. A large part of the work was done in company with Rev. W. L. Dawson, during the first four years, and with Mr. R. L. Baird, during the last two. It is needless to say that counting large companies of birds can be more accurately done by two working together than by one alone.

A glance at the weather for the months covered by this study may add interest to the discussion, and perhaps offer some explanation of the fluctuations from year to year.

Temperature alone in winter probably has relatively little to do with the winter movements of birds, unless the cold is intense; but cold, attended with a blanket of snow or ice—a frequent combination—is a condition to be reckoned with. In the following summary of weather conditions during the winters, I shall lay stress upon the conditions which would cause southward movements, or later in the winter, cause the winter birds on the ground to remain, leaving the reader to infer that when nothing is said about the weather it was not of such a character as to cause any marked movements of the birds.

The winter of 1895–6 opened during the first five days of December with snow and nearly zero temperature. A warm wave followed, removing the snow. The 11th brought us nearly six inches of snow and temperature a little below zero during the night of the 13th. This snow blanket began to grow thin on the 16th, and was gone after the rain of the 18th. This winter weather had a marked influence upon the birds, which was not offset by the summer weather which continued to almost the end of the month.

There was nothing in January which materially influenced bird movements, although three mornings during the first week the temperature was near the zero mark. A marked cold wave, with below zero temperatures in the middle of

February, served only to hold the winter birds from drifting north. There was not sufficient snow to cover their food.

During the winter of 1896–7 there was little snow at first, but severe cold in the Lake Superior region during the first week in December, and snows there, drove many northern birds southward, bringing into this region the usual winter fauna at the beginning of the winter.

January, 1897, opened like spring, but became snow-bound on the 5th, and only succeeded in releasing itself on the 17th in a thunder-storm. This release was followed, two days later, by the severest weather of the winter, reaching 16° below zero on the 25th; the month closing below zero. The strong contrast between January and February induced some of the hardier birds to move northward by the 17th of February, thus closing the winter. The temperature hardly fell below freezing after the first week of February.

The winter of 1897–8 did not fairly begin before the middle of December. There was just cold and snow enough during the last days of November and the first days of December to settle the somewhat frothy bird population, but not enough to drive any birds from the north down to us. The remaining days of December caused no changes in the bird population, because there was not enough snow to cover the food, nor long continued cold.

January, 1898, presented no interesting features except a thunder-storm on the 12th. There was much warm weather, but it came too early to have much influence upon the birds south of us. Severe cold in the Lake Superior region, about the 13th and 29th, tended to hold the birds steady in this region. February began severely cold and with snow, became spring-like during the second week, and was cold, for the month, the remaining days. The winter was not severe enough to bring us any unusual birds, nor to drive the Mourning Doves and Meadowlarks south.

Winter began, 1898–9, on November 23d, with snow and cold. Snow during the first and second weeks of December, and severe cold during the second week made the birds

settle down to solid winter conditions. The warm days during the last week came too late to influence the birds. It is worthy of record, however, that their food was so abundant that the Red-headed Woodpeckers remained in considerable numbers.

January, 1899, was in no wise unusual. Warm during the first week, cold during the second, warm during the third and closing cold, with more or less snow during the month, tells its story of any lack of influence upon the birds. With February it was very different. The first and second weeks were severe in the extreme. At Oberlin the temperature was scarcely above zero any morning during the first fifteen days. Following the cold came genuine spring weather, bringing Robins and Bluebirds on the 20th, and thus closing the winter.

A snow storm on December 4th to 6th ushered in the winter of 1899–1900. Another snow storm from the 13th to 16th, and a period of snow from the 26th to the 30th completed the winter records of this month. The remainder of the month was unusually mild. There was nothing unusual among the birds. January, 1900, was a continuation of December, until the last four days brought a cold wave and snow, the storm extending well into the first week of February. There were no bird movements. February was a month of sharp contrasts, ranging from 67° on the 9th to 4° below on the 27th, with two well marked cold waves: one in the third week and one in the fourth. There was no movement of the birds northward until March 7th.

The winter of 1900–1 began with snow in the north on November 12th to 15th, driving some birds southward at that time, but winter weather did not prevail in this region until December 13th, which was the culmination of the first real cold wave. The month presented no marked features.

January, 1901, opened with a crusted snow covering the ground, causing the absence of the carnivorous birds, except the owls. Mourning Doves were forced south by this complete blanket upon their food supply. For the rest of the

month, and for February, the temperature fluctuated between 56° at noon of January 10th and 3° on the mornings of February 23 and 28, but with no decided fluctuations of cold and warm waves. Snow covered the ground during the larger part of the month, arresting any tendency to northward movement before the end of the first week in March.

The winter 1901–2 was in a hurry to begin. Snow storms on November 5th and 6th, 13th to 17th, 19th and 23d, in the Lake Superior region, aided in the early beginning of winter conditions here. The winter birds were practically established on a winter basis early in November. Continued cold in the north region, combined with below zero temperatures here in the middle of December and on the 21st, brought about unusual occurrences in the bird world. Clearly the appearance of the Pine Grosbeak and White-winged Crossbills was due to this early severe weather and snow. January, 1902, was not peculiar, except for the absence of the regulation thaw, and the consequent almost continuous cold weather.

From the foregoing account of the weather conditions it will be seen that but one of the winters treated began early and continued wintry with little intermission, if any, and that this winter was the only one during which there were distinctly notable happenings in the way of the influx of the far northern species. It may be fair to infer that given similar conditions again there would be similar results.

The actual time covered from which these records are taken is January 1st, 1896, to January 15, 1902; during the winter season, of course. But the year 1896 does not figure in the court of individuals of the several species, because very meagre records of the individuals were kept during that year. Likewise, only the months of January and February, 1900, count in that year, because nothing was done during December, 1900.

Taking, then, one-half of each of the two winters represented in a single year, the number of species for each year stands as follows: 1896, 19; 1897, 36; 1898, 40; 1899, 35; 1900, 30;

1901, 42. And for the first fifteen days of 1902, 35. The number of trips taken during these years is as follows: 1896, 9; 1897, 11; 1898, 12; 1899, 10; 1900, 5; 1901, 14, 1902, 5. The number of species seen during this time reaches the rather startling number 65. That is fully one third as many as have ever been recorded during any entire year and is nearly two-fifths of all the species recorded for the county.

A more accurate record would include a single winter during which the conditions of temperature and weather and the food supply, would be far less variable than during parts of two winters. The records follow: 1896, 19; 1896–7, 37; 1897–8, 35; 1898–9, 41; 1899–00, 32; 1900–1, 34; 1901–2, 42. . The trips for the corresponding times were: 1896, 7; 1896–7, 7; 1897–8, 13; 1898–9, 12; 1899–00, 8; 1900–1, 9; 1901–2, 10. Of course there were some records made without any definite effort to get away from the village.

Comparing the five routes to determine which is richest in species, we find that during the time covered by the study there have been seen at Chance Creek, 39 species; Beaver Creek, 35; north overland, 22; south-east, 30; north-east, 32; while 12 have been recorded on the lake and 11 within the limits of Oberlin. The average number of species recorded for each of these five routes gives a slight advantage to Beaver Creek over Chance Creek, and a decided advantage to the stream gorges. Chance Creek, 20; Beaver Creek, 21; north overland, 17; south-east, 15; north-east, 14. One might expect the south-east and north-east routes, to be richer than the north overland route; since they touch the Black River gorge, but the old lake beaches more than compensate for any advantage that the shallow gorge might offer. The route is a longer one, also.

This comparison clearly proves the greater richness of the steep sided and deep stream gorges in species which regularly live there during the cold weather. The records for a series of years also prove that more species not regularly found in the county in winter resort to the stream gorges

when they do visit us. There is this to be said, however. During mild weather, especially when the ground is not covered with snow, fewer species are to be met in the river gorges and more of them are scattered over the uplands. The protection which these gorges offer is clearly the influence which calls the birds to lodge there. Other things being equal, food is more abundant and easier to get upon the uplands.

Let us turn, now, to the numbers of individuals which are more or less regularly found along these five routes during the winter days. It will not be interesting to treat each of them separately, but rather give the totals for all of the routes, with the deductions that may follow. In these totals of individuals let it be understood that they are *averages* for the five years of study, of all of the notes taken together ending January 15, 1902. For some of the more unusual resident species this amounts to a pretty accurate census, since they are found in a few localities only, but with those species which range over considerable territory in their quest for food, it is merely an average of those recorded during the several trips. It is useful as a guide to the haunts of the species, and serves to illustrate the relative abundance of the species as compared with others. The species, with their average numbers and a few remarks upon their mode and places of occurrence, follow.

American Herring Gull, 17; found on the lake only.

American Merganser, 10; on the lake only, and usually absent in late winter.

Red-breasted Merganser, 4; see the last species.

Mallard, 3; on the lake, and rather irregular in winter.

Old-squaw, too variable to assign numbers. Sometimes many winter on the lake.

Ruffed Grouse, not seen for three years, formerly found at Chance Creek.

Bob-white, 95; a small flock in almost every brushy pasture. Increasing.

Mourning Dove, 11; found near barns or where barn manure is scattered.

Marsh Hawk; irregular near the lake. One usually seen every winter.

Cooper's Hawk, irregular, but usually recorded during the winter.

Sharp-shinned Hawk; the records show but one each winter near woods. It is probably more numerous than the record shows.

Red-tailed Hawk, 7; almost anywhere over woods and streams.

Red-shouldered Hawk, 11; like the last but more frequent.

Broad-winged Hawk, 2; usually near the lake, but irregular.

American Rough-legged Hawk, 2; like the last. Usually flying over fields.

Bald Eagle, 2; the two usually in the vicinity of a nest near the lake.

Golden Eagle; twice seen in winter at the lake shore.

American Sparrow Hawk, 19; more frequent at the lake, but seen hovering over almost any field.

Pigeon Hawk, 3; always happened upon, usually when flying.

Barn Owl; one died in a barn near Oberlin.

Long-eared Owl; scarce. A colony of six recently found in a deep gorge tributary to Black River.

Short-eared Owl; one or two usually found at the lake shore. Occasionally seen inland also.

Saw-whet Owl; recorded only for Oak Point on the lake shore.

Barred Owl, 5; these five have regular dwelling places—two at Chance Creek, one in a wood north of there two miles, one in the south woods near Oberlin, and one in a wood south of North Amherst. Outside of these five routes there are at least five others known.

Great Horned Owl, 2; one in the south-east route, one in the north-east.

Screech Owl, 3; confined to Oberlin village so far as known. One has been recorded several times from the north-east route, and one in Chance Creek gorge once.

Hairy Woodpecker, 29; found wherever the troops of small winter birds are. That means in woods or weedy fields.

Downy Woodpecker, 70; like the last, but far more numerous.

Red-headed Woodpecker; not a regular winter resident. When it does remain it resorts to the deep woods, and is numerous there.

Red-bellied Woodpecker, 14; found in nearly every considerable woods.

Flicker, 13; generally distributed, frequently in towns, and about farm houses.

Prairie Horned Lark, 104; Horned Lark, 46. These two forms are scattered over the fields when there is no snow, but resort to the fields where barn manure is scattered when the land is snow bound. They are at the lake shore also.

Blue Jay, 50; pretty generally distributed, but more numerous in woods.

American Crow, 30; more frequent in stream gorges and in the vicinity of the slaughter houses, or where stock is fed.

Meadowlark, 26; more numerous at the lake shore, but in many sheltered fields.

Rusty Blackbird, one female was taken at Oak Point February 13, 1897.

Bronzed Grackle; one has been seen in Oberlin all winter for four years.

Pine Grosbeak; one found at Chance Creek, Jan. 1, 1902.

Purple Finch, 28; almost wholly confined to the stream gorges in winter. Once in woods near Oberlin.

American Crossbill; irregular, but recorded for Oberlin and Chance Creek.

White-winged Crossbill; six found feeding on hemlock cones on Black River Jan. 4, 1902.

American Goldfinch, 193; the flocks are generally large and range almost anywhere, but are more often seen in the

deep woods and stream gorges. A few scattering individuals are not infrequently met with anywhere.

Pine Siskin; irregular as a winter resident. Often with Goldfinches, or in flocks of few to many individuals in river gorges.

Snowflake, 20; usually found after severe north-west storms, in fields.

Lapland Longspur, 10; this and the last species are generally found with the flocks of Horned Larks, seldom by themselves.

Tree Sparrow, 600; this number is given to indicate that this is by far the commonest winter bird. The flocks are found in every woods and in many fields. Between Oberlin and lake Erie, in any direction, there are probably a thousand Tree Sparrows.

Slate-colored Junco, 106; almost invariably with the Tree Sparrows, but far more often in the stream gorges. The number given is an average of those actually recorded, and fairly represents the proportion to Tree Sparrows.

Song Sparrow, 33; one or more in almost every grass-grown thicket. More numerous in the lake shore swamps than elsewhere.

Cardinal, 30; largely confined to the stream gorges. Until the present winter usually found in nearly all considerable woods in twos and threes, but now they seem to be gathered in large companies in or near the stream gorges. 1902 has thus far yielded 25 for Chance Creek and 23 for Black River. An evident increase.

Cedar Waxwing, 52; likely to be seen anywhere, but more often at Chance Creek.

Northern Shrike, 4; this is a census. One near Oberlin, or in it, one on Black River below Elyria, one on Beaver Creek at South Amherst, one near the lake shore north of Chance Creek.

Carolina Wren, 3; another census. One at Chance Creek, two south of North Amherst in Beaver Creek. Only

recently arrived in the county. There may be another below Elyria on Black River.

Winter Wren; one recorded in Ely park at Elyria.

Brown Creeper, 6; there is probably one or more in every large woods, and from one to four in each stream gorge. The number given represents only those actually recorded.

White-breasted Nuthatch, 50; in all woods and in town. Undoubtedly this is a low estimate for this species.

Red-breasted Nuthatch, 3; one at Chance Creek, one on Black River below Elyria, one at Oak Point. Others are likely about.

Tufted Titmouse, 48; in almost every woods. Probably more in winter.

Chickadee, 70; more generally distributed than the last. Common in town.

Golden-crowned Kinglet, 10; recorded only for Chance Creek, Black River and Oberlin. Probably more numerous.

Robin; one regularly winters in Oberlin.

Bluebird; one or more found every winter of the study, usually in Obelin, but there is one record for Chance Creek.

To this list must be added two accidental records.

Horned Grebe, one found on the streets of Oberlin in an exhausted condition, its gizzard crowded full of small rubber bands. It died.

Brunnich's Murre, four captured at Lorain, December 25, 1896, by Mr. A. Hengartner.

Others than these might be recorded, but their occurrence would not fall within the limits set.

Eliminating, for the purpose of determining the census of the region covered, all but the species which are regularly found every winter, or almost every winter, there remain fifty species. Among these fifty there are several whose numbers can be pretty accurately given for the ground covered by these five routes, because they are confined to known places. These are:

American Herring Gull, 17; on Lake Erie only.

Bald Eagle, 2; at their eyrie near Oak Point.

Great Horned Owl, 2; in two deep woods, southeast and northeast of Oberlin.

Bronzed Grackle, 1; in Oberlin.

Northern Shrike, 4; as already given.

Carolina Wren, 3; as already given.

Robin, 1; in Oberlin.

Of the remaining 44 only averages for these five routes can be given. But the work done outside of these routes proves that they are fairly representative of all of the territory covered, and so represent the average bird population for any given region of like extent in this part of the county. There is little reasonable doubt that the whole county is also fairly represented in this region. There may be deeper and more extensive woods in the eastern part than we know here, but there is certainly not more coniferous timber, nor more favorable places for a large percentage of the birds.

It is needless to say that there is here no basis for any sort of an estimate of the whole bird population of the county. All that can be said is that anywhere in the county one might expect to find an equal number of birds under equal conditions. The territory covered is far too little in proportion to the whole to state more than this. But there is one important consideration which this censo-horizon work leads to. It is the possibility which it holds out for a solution of the perplexing question of the meaning of the commonly used terms "common," "rare," "abundant," etc. It affords a basis for assigning definite values to these terms. But that is a task far too great to be adequately considered as an incidental part of another paper. It is deserving of a separate paper, which I hope may be forthcoming at no distant day. Until these wholly indefinite terms can be given some definiteness, can they be used to convey any intelligence to others than those who personally know the region spoken of.

The smaller land birds, at least, are gregarious to a greater or lesser extent. Some are naturally gregarious within the

species, some within the families, as the Icteridæ, or blackbird group. Sometimes this instinct is hardly apparent, but with some species it is very marked, the birds of a species even nesting in communities. It is, perhaps, suggested in the species which usually show faint traces or none, by the community of interest exhibited at the call of distress from any bird. In the winter this faint instinct shows far more prominently than at any other season with the birds as a whole. Then the smaller woods birds habitually go in troops or companies. Some species are habitually found together, or found in these troops, while others are more independent and wander from the troop when occasion seems to demand. It must not be supposed that when I say that some species are habitually found together that therefore they may never be found alone. That would be carrying the statement over into the impossible, but it is true that certain species are rarely separated in the winter months. It is also true that these same troops of species are the leaders of troops during the height of the spring warbler migration. The point I wish to make is, that birds are not, as a rule, scattered helter-skelter about any region. They are more evenly distributed over any given region during the period of nesting than at any other time.

The species which almost always form a bird troop in winter are as follows: Chickadee, White-breasted Nuthatch, Tufted Titmouse, Downy Woodpecker, Hairy Woodpecker, Blue Jay. With these are often associated the Red-bellied Woodpecker, Flicker, Song Sparrow, Cardinal, Tree Sparrow, Junco, Goldfinch, Red-breasted Nuthatch and Brown Creeper. Still rarer species which may be attracted by the food rather than by a desire for company, may be mentioned: Cedar Waxwing, American Crossbill, Purple Finch and Pine Siskin. All of these are woods birds. Out in the fields we frequently find the Horned and Prairie Horned Larks, Lapland Longspur and Snowflake, in companies. Such species as the Crow, Meadowlark, Mourning Dove, Bob-white and the water birds, are naturally gregarious

within the species, during the winter, but the different species are seldom found together. The birds of prey and Northern Shrike are essentially solitary in habits. Bluebirds and Robins are found as solitary individuals simply because they are so rare as winter birds.

It is clear, then, that to be successful in the winter study of birds one must know something of their favorite feeding places before they can be found at all. In extreme weather they seek protected places, just as you would if compelled to pass all of your time out of doors—indeed, just as you do when you step out of the storm into your home and the comforts of the fireside. I sometimes think that we make too hard work of our bird studies. By inquiring what we should do if we were forced to live the life of the bird, we shall not go far wrong in our interpretation of bird life. Of course we should not reason out what it might be ultimately best to do, but what the first impulse dictates. Birds are the most impulsive creatures living.

Undoubtedly one of the great determining influences upon the local and general distribution of birds, since they are able to travel so easily and so far, is the food supply. Birds are great eaters, because they live so fast. A fever heat temperature requires a large amount of fuel. That is why the birds are feeding all day long in winter. Of course they will go where the food is the most abundant, or where it is obtainable with the least effort. Usually that will be in some sheltered place for the woods birds, but may be an exposed place for the field birds. But since field birds feed upon the ground very largely, they will not be greatly exposed to cold winds there. When such a bird must feed in a strong wind it will invariably turn facing the wind. The other way its plumage would be blown away from its body and so expose it to the full force of the cold. Heading into the wind becomes pretty nearly a necessity in winter.

In the most severe weather, or when the country has become snow-bound for a considerable time, the Crows, Mourning Doves, Meadowlarks and the two forms of Horned Larks,

may be forced into the barnyard for food. Twice the Horned Larks have braved the dangers of civilization and come to the heart of town to glean there. Food they must have, or die.

It may be interesting to give a list of the species which may be found within the limits of Oberlin during some time in the winter, not every winter, perhaps, but during a series of years. The most noticeable one, not to mention that vermin, the English Sparrow, is the Blue Jay. It is on hand in any weather, if you have a kitchen scrap barrel or box. Next is the Downy Woodpeeker, closely seconded by the Hairy Woodpecker. Every cold morning one greets me (one of each species) when I am cleaning the walk. Several live on the college campus and in the adjoining trees. Less commonly with them may be seen the Chickadee and White-breasted Nuthatch, usually quiet on cold days, except for that strenuous little chip, while searching for the frozen morsel. Occasionally a Sparrow Hawk or a Northern Shrike come to town, where the sparrows are such easy prey. I have already spoken of the Horned and Prairie Horned Larks coming in during cold, snowy weather. One old Flicker lives in the cupola of Council Hall and forages in the adjoining orchards and back yards. In the neglected back lots Song Sparrows, Tree Sparrows, Juncoes and Goldfinches may be found helping some one about next season's gardening. One old Bronzed Grackle and one old Robin refuse to leave the classic village even in the coldest weather. They forage in back yards for a living. A Bluebird pays occasional visits. A Tufted Titmouse or two is sure to pay a call before the close of winter. At least three Screech Owls live about town, known by their wooing all winter long. Once a Mourning Dove and once a Meadowlark ventured into town during December. The Meadowlark rested in a treetop in the midst of the campus. The Red-tailed and Red-shouldered Hawks pass to and fro over town, but I have not counted them. One Horned Grebe was found exhausted on Prospect street in December. Golden-crowned

Kinglets feed in the evergreen trees on the campus and about town all winter. A Brown Creeper has made the college campus his feeding ground this winter. One flock of a dozen Bob-whites ventured well within the settled portion, for no apparent reason, unless their ancestors owned that particular spot by right of long occupation. Crows have frequently passed over within easy range. American Crossbills and Cedar Waxwings are irregular winter residents.

A question that I have often asked myself may occur to others. How is it that the birds pass over the same field, or even small area of weed tops, again and again during the winter, evidently finding something to eat each time? Or, in another way, why don't they clean each weed head up before going to another? One could not watch a company of Tree Sparrows for five minutes without discovering that they merely nip here and there as they pass along, without the intention of making an entire meal at any one place, however abundant the food. There appear to me to be two reasons for this conduct. First, in cold weather they must keep moving or freeze. Second, they want variety. Neither would be true of the flesh-eating birds, both because they are larger and therefore have greater resistance to cold, and because they bolt their food and digest it without grinding. They seldom feed upon frozen food, as the smaller birds must. In the cold weather the smaller birds keep moving all day long, or else seek some sheltered place where a degree of comfort is possible, and all the while they are feeding, now upon this, now upon that sort of food. Even the woodpeckers don't stop to dig long in one place.

If movement is necessary to life in cold weather, how can the birds sleep? Just like any other animal, I suppose. They seek out some sheltered place and curl up. The woodpeckers and other birds which nest in holes in trees sleep there in winter. The sparrows and other birds which build nests in bushes or trees or on the ground, find shelter among the dried foliage of last season, or among the grass on the ground, or even under the snow. Many times have

I startled the Horned Larks and Longspurs from their snow beds, early in the morning. With a little volcano of snow they burst through the slight crust, vaulting into the frosty air, only to dive beneath the snow again, just beyond harm's way. This burrowing habit of the Prairie Chickens is well known to all who hunt. The hawks seek out some dense evergreen, or oak from which the brown, dry leaves have not been torn. The owls do the same, or crawl into a hollow trunk.

Why don't birds' feet freeze, I have often been asked. They do, sometimes. There isn't much about them to freeze but skin and tendons. The skin is a horny sort of skin, and the tendons are tough. Such material does not freeze readily. When the birds squat, as they do when perched, the feathers form a warm blanket for the feet and legs. A hungry bird, I mean one which has fasted long, is an easy prey for the frost. A bird's vitality is much more quickly sapped by fasting than ours is, as they are faster livers than we are. But for their covering of feathers, the warmest possible garment for its weight, none could hope to survive the rigors of our northern winters.

I have spoken of the few Bluebirds which remain with us all winter. Ten years ago no Bluebirds were ever seen in winter in the county. During that phenomenal winter of 1894–95, when the South was swept by such a cold wave that the orange trees in Florida were destroyed, and Tennessee suffered one of the severest weeks since the Civil War, the Bluebirds which had gone into that warmer region to winter, were all but exterminated. They had wintered in that comparatively warm region for so many generations that when the severe cold did come they were unable to withstand it. But the comparatively few individuals which tarried in southern Ohio were able to live through even severer weather, and it is the descendants of that hardier race which find northern Ohio bearable now.

What do the birds eat when everything is covered with snow and ice? That depends upon the bird. The large

flesh-eating birds must have flesh, and the grain-eating birds, including the sparrows and Bob-white, and the Ruffed Grouse, of course, live on vegetable matter. It is hardly going beyond the facts to say that the smaller insect-eating birds will take anything that can be found. The woodpeckers eat large proportions of seeds and other vegetable matter, in winter, and so do the nuthatches, and tit-mice. The Brown Creeper may not eat vegetable matter. Crows and jays eat anything. In the severest weather, when the north of Ohio is covered with snow but the southern part is free from it, or nearly so, as sometimes happens, the birds of prey go to the less snowy regions and remain until there is a change, food being easier to obtain under such conditions.

If there is one lesson which the study of birds in winter teaches more than another, it is that there can be no hard and fast line drawn in respect to what birds will eat when their ordinary food is hard to get or wholly wanting. Birds that are supposed to subsist wholly upon insects or similar food, will take large proportions of vegetable food in winter. The soft inner bark of many trees furnishes a never failing supply of food for some of the woodpeckers at least. One needs to think but a moment to perceive that one of the essentials of a bird whose residence is in a nothern region for the whole year, is the ability to adapt itself to the conditions, which are certain to be variable. Winter bird life is but one of the chapters in the story of the development of the intensely interesting class—Birds.

A PRELIMINARY LIST OF THE BIRDS OF YAKIMA COUNTY, WASHINGTON.

BY WM. LEON DAWSON.

Yakima county, in south-central Washington, attracts attention as containing one of the most fertile and salubrious sections in the entire state. The county measures, approximately, fifty by one hundred and twenty miles, but the cultivated land lies almost exclusively along the Yakima river and in those tributary valleys which center in or near the city of North Yakima. The eastern and south eastern portion, or greater half of the county, consists of arid and treeless plains interrupted by frequent low mountain ranges of Columbian lava. The western third is increasingly mountainous and correspondingly timbered, including, as it does, Mt. Adams, and the eastern approaches of Mt. Rainier.

As we should expect, therefore, the larger portion of the county presents a fauna which is strictly Upper Sonoran; but from there westward a transition is made to the Boreal fauna; and in the extreme west a junction must be in some way effected with the saturated forms of Puget Sound.

Our interest, however, centers in a typical valley in the most favored agricultural region, the middle-northern. The Ahtanum valley stretches westward from North Yakima between barren hills for a distance of some twenty miles. At this point the stream forks. Its barriers rise to the dignity of mountains. Evergreen timber begins and increases in density until we are lost in the depths of the higher ranges. The valley proper is abundantly watered, both naturally and artificially. The characteristic covers for birds are, therefore, furnished by willow and rose thickets, bounding the tiny, sub-divided streams; high, open groves, or "timber cultures" containing poplars and quaking asps; occasional swamps, or "slews;" and by the universal setting of sage-brush.

Amid these surroundings, and at a point about eight miles up the valley, the writer lived three years—'85–87, and

'99–'00—and spent parts of four spring seasons beside. It was during the latest residence of a year, '99–'00, that the best opportunities for observation were afforded. It was here upon our "Five Acres of Bird-land," reported in THE WILSON BULLETIN, No. 32, that I recorded 63 species of birds in the nine months of a year, exclusive of spring. This little spot,with its singularly varied topography, is referred to in the following notes, for lack of a more comprehensive name, as "the demesne." From here, also, I was enabled to make frequent trips and sallies, sometimes to the "South Range" of hills, sometimes to the timbered mountains, and once to the narrow paradise of the Lower Yakima.

On the whole, birds are not abundant in the Yakima country, either in number of species or individuals. The best strictly local horizon for a day comprised only 35 species; while the best county horizon, taken on a trip from Ahtanum to the Yakima Soda Springs, included but 50 species. The migrations are not very conspicuous. The resident birds slip into their places rather quietly; while birds known to be common further north are seldom seen as they move to and fro.

Of especial note, however, are the changes which have taken place in the status of different species. A period of observation covering roughly fifteen years has witnessed many important modifications in the distribution of birds. Decrease has been apparent in the hawks and owls, except the Burrowing Owl, and in the game birds, such as ducks, geese, grouse and curlews. But this has been offset by a most gratifying and unmistakable increase among the Passerine birds, and those which can in any way profit by civilization. Among this number may be cited the Arkansas Kingbird, Say's Pewee, Bullock's Oriole, Rusty Song Sparrow, Lazuli Bunting, Robin and others. It would seem probable that certain species, as Cowbird and Cliff Swallow, have invaded the region solely because of the advent of man.

The following list is to be understood as strictly prelimi-

nary, a working basis for future investigation, and necessarily incomplete as yet because of the immense territory to be covered:

1. **Sterna hirundo.** Common Tern.—A solitary bird was seen at Union Gap August 19, 1899.

2. **Merganser serrator.** Red-breasted Merganser.—Some sixteen years ago I caught a bird asleep beside a pool of the Ahtanum creek.

3. **Lophodytes cucullatus** Hooded Merganser.—One shot on Minner's pond. Others reported.

4. **Anas boschas.** Mallard. The common duck.—Breeds.

5. **Nettion carolinensis** Green-winged Teal.—Fairly common.

6. **Querquedula cyanoptera.** Cinnamon Teal.—Two records.

7. **Erismatura jamaicensis.** Ruddy Duck.—One record, Minner's pond, October 26, 1899.

8. **Branta canadensis occidentalis.** White-cheeked Goose.—The common goose. Breeds sparingly.

9. **Ardea herodias.** Great Blue Heron.—Not common.

10. **Grus mexicana.** Sandhill Crane.—Not common except during migrations. A single bird was once observed wading in a shallow of the Yakima river. The bird behaved as awkwardly as a sore-footed Tommy Atkins, and once he actually fell into the water.

11. **Rallus virginianus** Virginia Rail.—This bird and the next are to be found in any considerable tule swamp.

12. **Porzana carolina.** Sora.

13. **Gallinago delicata.** Wilson's Snipe.—Common. Resident.

14. **Tringa baridii.** Baird's Sandpiper.—An extensive tour of the country during the month of August developed the presence of multitudes of these birds. Singly or in small groups they frequent every wayside plash and overflowing irrigating ditch.

15. **Tringa minutilla.** Least Sandpiper.—A single flock once swept over the demesne, piping loudly.

16. **Totanus melanoleucus.** Greater Yellow-legs.—By the side of a farm-yard pond I once watched a bird which seemed rather to enjoy company so long as you didn't actually step on him. With immaculate under-garments rolled tightly above each knee, he would adventure to wade around you rather than to fly out of your way.

17. **Actitis macularia.** Spotted Sandpiper.—Regular but not common.

18. **Numenius longirostris.** Long-billed Curlew.—Not uncommon. Breeds.

19. **Aegialitis vocifera.** Killdeer.—Common.

20. **Canachites franklinii.** Franklin's Grouse.—The "Blue Grouse" is the common bird of the lower mountain ranges.

21. **Bonasa umbellus togata.** Canadian Ruffed Grouse.—Of re-

stricted range. Found commonly in the bottom of valleys in the lower slopes.

22. **Pedioecetes phasianellus columbianus.** Columbian Sharp-tailed Grouse.—The local "Prairie Chicken" was once abundant, but is falling off in numbers every year. Where they are able to hold their own at all, it is in the oldest settled parts where food is plentiful and some protection afforded.

23. **Centrocercus urophasianus.** Sage Grouse.—Sixteen years ago a neighbor boy showed me a nest of Sage Hen's eggs from which I was allowed to abstract "just one." The remainder were destined in due season for a domestic career. The parent bird returned within an hour, and, smelling the odor of humans, ruthlessly destroyed the tainted eggs. It served us jolly well right, too: those eggs should have been appropriated in the name of science—neighbor to the contrary notwithstanding. Hold! I forget! He was bigger than I. The Sage Grouse of the Yakima is rapidly nearing extinction. I saw only one small flock during my last year's residence.

24. **Zenaidura macroura.** Mourning Dove.—Abundant.

25. **Cathartes aura.** Turkey Vulture.—Not uncommon. Nests in caves and crevices of the Natchez cliffs and elsewhere.

26. **Circus hudsonius.** Marsh Hawk.—Perhaps the commonest hawk twenty years ago. The rustic has waged a witless warfare against it, and is reaping a well deserved harvest of "ground squirrels" in consequence.

27. **Accipiter velox.** Sharp-shinned Hawk.—Not uncommon.

28. **Buteo borealis calurus.** Western Red-tail.—The species was unknown to me during my earlier residence, but I saw one bird on the Lower Yakima in the summer of '99.

29. **Buteo swainsonii.** Swainson's Hawk.—All the Buteos are rare here in Yakima, but this is probably the commonest one.

30. **Archibuteo lagopus sancti-johannis.** American Rough-legged Hawk.—Three individuals clearly distinguished April 3, 1900.

31. **Archibuteo ferrugineus.** Ferruginous Rough-leg.—No considerable walk or ride over the barren foot-hills is complete without a glimpse of these majestic birds.

32. **Haliaeetus leucocephalus.** Bald Eagle.—I have a record of a solitary eagle guarding his nest on the Yakima river, near Snipe's mountain. Also a "yard record" for March 5, 1900. The bird was, of course, flying overhead.

33. **Falco mexicanus.** Prairie Falcon.—Not uncommon when once the eyes have been opened, but it is a bird of which *vulgus homo* knows nothing. It is to be seen most frequently about the summits of the untimbered ranges.

34. **Falco peregrinus anatum.** Duck Hawk.—While riding along at the head of a funeral procession, where I didn't care to crane my neck too curiously, I saw a Peregrine Falcon make a wanton swoop of a hundred yards or so and then go mincing off like a

skittish horse at sight of the unwonted spectacle. There is only one Peregrine.

35. **Falco columbarius.** Pigeon Hawk.—Several clear records, including one yard record, September 18, 1899.

36. **Falco sparverius deserticolus.** Desert Sparrow Hawk.—Of five hawks in sight at once four are bound to be Sparrows.

37. **Asio wilsonianus.** American Long-eared Owl.—Common. Nests.

38. **Asio accipitrinus.** Short-eared Owl.—One record of several seen in the lower Moxee swamp.

39. **Megascops asio macfarlanei.** MacFarlane's Screech Owl.—Quite rare. Two yard records.

40. **Bubo virginianus arcticus.** Arctic Horned Owl.—Fairly common fifteen years ago. None seen in '99–'00.

41. **Speotyto cunicularia hypogaea.** Burrowing Owl.—Abundant, and manifestly increasing. It is well, since farmers will kill hawks indiscriminately.

42. **Glaucidium gnoma californicum.** California Pygmy Owl.—One specimen shot during the winter of '86–'7, the only one ever seen.

43. **Ceryle alcyon.** Belted Kingfisher. Common.

44. **Dryobates pubescens gairdnerii.** Gairdner's Woodpecker.—Yard record and others. Not common.

45. **Xenopicus albolarvatus.** White-headed Woodpecker.—Not rare in the mountains.

46. **Sphyrapicus thyroideus.** Williamson's Sapsucker.—The county record was made August 9, 1899, when a female was closely studied at the Yakima Soda Springs.

47. **Melanerpes torquatus.** Lewis's Woodpecker.—The Black Woodpecker was rare a dozen years age except along the upper reaches of the Yakima river. Its fondness for fruit has, however, given it a general distribution of late, and a notable increase in numbers.

48. **Colaptes cafer.** Red-shafted Flicker.—Owing to the scarcity of timber this bird has taken to public and vacant buildings, especially school houses, and because of his destructiveness to the woodwork a price is often put upon his head.

49. **Phalaenoptilus nuttallii.** Poor-will.—Among the sweetest memories of boyhood is the plaintive whistling of this bird along about milking time. A few still linger, but it does not take kindly to the ways of civilization.

50. **Chordeiles virginianus henryi.** Western Nighthawk.—Common. In the lower Ahtanum valley I have seen upwards of 200 of them gyrating, swallow fashion, within the limits of a single pasture.

51. **Chaetura vauxii.** Vaux's Swift.—Two seen in a mountain valley, the north fork of the Ahtanum.

52. **Stellula calliope.** Calliope Hummer.—A dubious identification

of a couple of birds seen in the demesne. Humming-birds are very rare in the Yakima country.

53. **Tyrannus tyrannus.** Kingbird.—Not common. A quiet bird beside his garrulous cousin.

54. **Tyrannus verticalis.** Arkansas kingbird.—Common. On the increase.

55. **Sayornis saya.** Say's Phœbe.—I did not make the acquaintance of this bird during my first residence of two years, '86–'87. The first bird was seen in a Tampico barn in the spring of 1891. Since then it has increased rapidly, until it is now the presiding genius of every hop-house (dryer) and barn. A typical spring record is February 20, 1900.

56. **Contopus richardsonii.** Western Wood Pewee.—Not very common. A bird of marked local attachments, and probably on the increase.

57. **Empidonax hammondi.** Hammond's Flycatcher.—If one may believe anything at all about these very difficult "gnat-kings," Hammond's is the common bird and the noisiest of the lot. In the "spring" migration of 1899 he *arrived* on June 14, and very presently set up housekeeping. I found his nest on the 27th. On July 4th it contained one egg, and on July 10th still only two, which I took. The eggs in this case were not white but creamy, with scattered spots of reddish-brown, much like a Western Wood Pewee's. Weary! weary! but those Empidonaces are a most ungetatable lot, the tricksiest sprites in nature.

58. **Octocoris alpestris leucolaema.** Pallid Horned Lark.—The winter birds, which are not common, are believed to belong to this sub-species.

59. **Otocoris alpestris merrilli.** Dusky Horned Lark.—Common; especially so on the summits of the treeless ranges, where it breeds freely.

60. **Pica pica hudsonica.** American Magpie.—The most badly wanted bird of the Yakima. Incessant persecutions have only produced additional convolutions in the cerebral hemispheres of Magpie's brain, and the bird still has a fighting chance for life. In my little day I have semi-officially inspected something over a hundred fortifications which this bird was pleased to erect for the defense of his children.

61. **Cyannocitta stelleri annectens.** Black-headed Jay.—Common in the evergreen timber. Rare below.

62. **Corvus americanus.** American Crow.—An old residenter with many strange habits, but no "characters" differing from the eastern bird.

63. **Nucifraga columbiana.** Clarke's Nutcracker.—Not rare in heavy timber.

64. **Molothrus ater.** Cowbird.—Unknown till recently.

65. **Agelaius phoeniceus.** Red-winged Blackbird.—Fairly common.

66. **Sturnella magna neglecta.** Western Meadow Lark.—Common.

The bird with the merry heart which maketh a glad countenance.

67. **Icterus bullocki.** Bullock's Oriole.—Common. Increasing.

68. **Scolecophagus cyanocephalus.** Brewer's Blackbird.—One of the autochthones. Omnipresent and not justly complained of.

69. **Loxia curvirostra minor.** American Crossbill.—Resident in mountains.

70. **Loxia leucoptera.** White-winged Crossbill.—One record, May 15, 1891.

71. **Acanthis linaria.** Redpoll.—Swarms in winter.

72. **Astragalinus tristis.** American Goldfinch.—Fairly common.

73. **Spinus pinus.** Pine Siskin.—Noted during my last year's residence throughout the year, except in winter. Where and when they breed is the mystery, since they are back by the middle of March and appear in care-free troops the rest of the time.

74. **Passerina nivalis.** Snowflake.—Unmistakably heard once, November 4, 1899.

75. **Poœcetes gramineus confinis.** Western Vesper Sparrow.—Fairly common.

76. **Chondestes grammacus strigatus.** Western Lark Sparrow.—Not very common. Perhaps increasing.

77. **Zonotrichia leucophrys gambellii.** Intermediate Sparrow.—Swarms through the country during migration, and probably remains sparingly to breed.

78. **Spizella monticola ochracea.** Western Tree Sparrow.—Once recorded a flock of 25, on February 17, 1900, in the Ahtanum valley.

79. **Spizella socialis arizonae.** Western Chipping Sparrow.—Universally but sparingly distributed up to and a little beyond pine timber.

80. **Spizella breweri.** Brewer's Sparrow.—The sage wastes in spring and summer fairly teem with these sprightly and tuneful sparrows. Under their zealous ministrations the desert is transformed into a passable paradise of song.

81. **Junco hyemalis connectens.** Shufeldt's Junco.—Relying upon the example of Mr. Rathbun ("The Auk," April, 1902, p. 137), I set down the breeding bird of the timbered mountains as *J. h. connectens*. The winter birds of the lower valleys belong probably to the next sub-species.

82. **Junco hyemalis oregonus.** Oregon Junco.—Common in winter.

83. **Amphispiza belli nevadensis.** Sage Sparrow.—Noted only during the spring of 1895, when one specimen, a singing male, was taken from a group of resident birds.

84. **Melospiza melodia morphna.** Rusty Song Sparrow.—Common resident. The Yakima Song Sparrow may prove to have closer affinities with *M. m. merrilli*, or even to deserve separate elaboration.

85. **Pipilo maculatus megalonyx.** Spurred Towhee.—Common. The Towhee of eastern Washington will fall an easy victim to the first species hunter with a gun.

86. **Zamelodia melanocephala.** Black-headed Grosbeak.—Not common. Yard record.

87. **Cyanospiza amoena.** Lazuli Bunting.—A common and delightful songster.

88. **Piranga ludoviciana.** Louisiana Tanager.—Fairly common, especially in pine timber.

89. **Petrochelidon lunifrons.** Cliff Swallow.—Time was when the only Cliff Swallows known to the county were to be found about the old school house at Yakima City. Since then they have become widely but not universally distributed.

90. **Hirundo erythrogaster.** Barn Swallow.—A familiar but not abundant breeding bird.

91. **Tachycineta bicolor.** Tree Swallow.—Not common.

92. **Tachycineta thallassina.** Violet-green Swallow.—Found only, as yet, in the mountains and about the wilder basaltic cliffs. They throng the narrow gorge of the Upper Yakima.

93. **Clivicola riparia.** Bank Swallow.—Common.

94. **Ampelis cedrorum.** Cedar Waxwing.—An invariable accompaniment of Yakima cherries, in season.

95. **Lanius borealis.** Northern Shrike.—Common in winter.

96. **Lanius ludovicianus excubitorides.** White-rumped Shrike.—Rather rare. Breeds.

97. **Vireo gilvus.** Warbling Vireo.—Fairly common.

98. **Vireo flavifrons.** Yellow-throated Vireo.—An unmistakable member of this species was narrowly scrutinized in a quaking asp grove of the middle Ahtanum, May 12, 1895.

99. **Vireo solitarius cassinii.** Cassin's Vireo.—A characteristic bird of groves and timber cultures.

100. **Helminthophila celata lutescens.** Lutescent Warbler.—Common summer resident.

101. **Dendroica aestiva.** Yellow Warbler.—Abundant.

102. **Dendroica coronata.** Myrtle Warbler.—One record, April 30, 1891.

103. **Dendroica audubonl.** Audubon's Warbler.—Abundant during migrations; probably breeds in the mountains. The *avant courier* for 1900 appeared March 11th. The bulk of the species passed through a month later.

104. **Dendroica townsendi.** Townsend's Warbler.—A late migrant. They thronged my trees on June 5, 1899. One returned, still singing, on August 23rd.

105. **Geothlypis tolmiei.** Macgillivray's Warbler.—A familiar inhabitant of brushy tangles.

106. **Geothlypis trichas occidentalis.** Western Yellow-throat.—Common.

107. **Icteria virens longicauda.** Long-tailed Chat.—A brilliant and much cherished performer. Happy is the grove that boasts a pair of these wariest of singers.

108. **Wilsonia pusilla pileolata.** Pileolated Warbler.—Common during migrations. I have not yet found it breeding.

109. **Anthus pensilvanicus.** American Pipit.—Abundant during migrations.

110. **Cinclus mexicanus.** American Dipper.—Found sparingly on the larger and wilder streams.

111. **Oroscoptes montanus.** Sage Thrasher.—The peerless singer of the open sage. His kingdom is being taken away from him, but his laurels none can destroy.

112. **Salpinctes obsoletus.** Rock Wren.—Found occasionally on the lava ranges.

113. **Troglodytes aedon aztecus.** Western House Wren.—One record, May 13, 1895.

114. **Cistothorus palustris paludicola.** Tule Wren.—Several seen in lower Moxee swamp.

115. **Sitta canadensis.** Red-breasted Nuthatch.—Not uncommon during migrations. Doubtless breeds in the mountains.

116. **Parus atricapillus occidentalis.** Oregon Chickadee.—Common resident.

117. **Parus gambeli.** Mountain Chickadee.—One record, May 15, 1891. Probably not uncommon in pine timber.

118. **Regulus satrapa olivaceus.** Western Golden crowned Kinglet.—Winter resident in lower valleys. Probably breeds in mountains.

119. **Regulus calendula.** Ruby-crowned Kinglet.—Found only during migrations.

120. **Hylocichla ustulatus.** Russet-backed Thrush.—An omnipresent bird of river-side, thicket and grove.

121. **Merula migratoria propinqua.** Western Robin.—Common.

122. **Sialia mexicana occidentalis.** Western Bluebird.—Only once seen in the Ahtanum valley, October 23, 1899.

123. **Sialia arctica.** Mountain Bluebird.—Breeds sparingly in the mountains and is only occasionally seen in the lower valleys.

To this may very properly be appended a brief list of those birds of which no record has been made, but which may be regarded as morally certain to occur within the limits of the county. The list is purposely moderate:

Western Grebe.	Pileated Woodpecker.
Holbœll's Grebe.	Oregon Jay.
Loon.	Cassin's Purple Finch.
American Golden-eye.	Rough-winged Swallow.
Buffledhead.	Calaveras Warbler.
Hutchin's Goose.	Hermit Warbler.
American Coot.	Western Winter Wren.
Sooty Grouse.	California Creeper.
Golden Eagle.	Slender-billed Nuthatch.
Red-breasted Sapsucker.	Pygmy Nuthatch.

INCUBATION PERIOD OF THE MOCKING BIRD.

BY JOHN W. DANIELS, JR.

Little has appeared concerning the exact time required by various species of birds for the incubation of their eggs. The period of time necessary for the development of the egg contents, from the fresh state to the hatching point, must needs vary with species and be subject to the many diversified conditions under which birds breed. Features of climate, as sunshine, atmospheric humidity, precipitation and temperature enter, along with locality, time of year, nesting site, nesting material, and nesting habits in general, as potent factors of control. In order to determine the period of incubation of any species the closest observation is necessary, and the observer should visit the nest daily, from the time of the laying of the first egg until the young leave the nest; and better still, if his observations commence with the laying of the foundation of the nest and are carried on until the young are able to fly. Exact data, as to the time necessary for the incubation of the eggs of even our commonest birds, is very meager—so here is a little-worked and profitable field for research; and as the securing of this information involves no destruction of bird life, it may be had without sacrifice of any sort save that of time and patience.

The following data regarding the period of incubation of the Mocking Bird (*Mimus polyglottos*) was secured in Campbell county, Virginia, April 29th to June 3rd, 1901, inclusive. Upon the former date the half-completed nest was found, and upon the latter date the young were seen to leave the nest. The nest was five feet up among the lower branches of a Norway spruce, which grew within twelve feet of the veranda of our home, in our front yard. Thus, the nest could not have been more favorably located for my purposes of observation, as its nearness to my home allowed me to visit it daily, regardless of weather, and at short intervals:

April 29. Found the half-completed nest.

May 3. Examined the nest and found it completed, apparently ready for eggs.

May 4. Nest still empty.

May 5. First egg laid.

May 6, 7 and 8. An egg followed each morning for three days. Parent bird started incubating with egg No. 1, and was on nest constantly thenceforth. Visited nest early and often each morning with a view to getting data as to time of laying of each egg. It was not possible to find out the precise time, but an approximate schedule was made as follows.

Egg	No.	1,	deposited	8:30	A. M.
"	"	2,	"	9:00	"
"	"	3,	"	8:00	"
"	"	4,	"	8:45	"

May 9, 10 and 11. Visited nest. Both parents present, one on nest and other in adjoining shrub.

May 12. Examined nest and was sorry to note that one egg had disappeared—no doubt the work of a jay or crow. Parents around, though seeming shy.

May 13. Visited nest. Both birds present, one on nest. Both very demonstrative.

May 14. Visited nest. Parent bird incubating, as usual.

May 15. Much to my regret I found another egg missing from the nest this morning. Both birds around, apparently much distressed. Would like to catch the thief.

May 16. Visited nest and was glad to find bird sitting upon the two remaining eggs.

May 17. Visited nest. Parent flew from it. Both present. They scolded, and one fluttered so close as to almost touch me.

May 18. Visited nest. Parent flew from it upon my approach. One bird seems to stay on guard on the topmost branch of a nearby shrub while the other bird incubates. On nearly every visit this has been the case. The bird on guard utters a wheezing sort of note on my approach, which seems to warn the sitting bird, as she at once leaves the nest.

May 19. Visited nest. Both birds present, scolding vigorously; are becoming accustomed to me, as they approach nearer.

May 20. Visited nest. One bird on guard on topmost branch of a nearby tree, as usual. Both birds very noisy and approached quite near to me when I examined nest.

May 21. Visited nest. Both birds around as usual; bolder than ever; very demonstrative. Both alighted in branches of the spruce a few feet above my head.

May 22. Visited nest. Birds around as usual.

May 23. Visited nest. Lo! the two eggs have disappeared and two young now occupy the nest. Both old birds still bolder, approaching within a few feet of me when I go near the nest. Young have not opened their eyes yet, and are entirely naked, save for a few patches of down.

May 24. Visited nest. Both birds constantly scolded and fluttered at me. Young have not changed appreciably; their eyes are still closed.

May 25. When I approached the nest the parent birds became bolder than ever. They have now become accustomed to me and take liberties. One struck the brim of my hat with its wings, first hovering just above my head and then descending with quick a movement. Young have not opened their eyes but seem lively, and open their mouths for food when I touch the nest. Not changed much in appearance.

May 26. Visited nest. Young slightly larger; points of primaries appearing; eyes open; mouths open at slightest movement near nest; old birds demonstrative as usual.

May 27. Visited nest. Rainy day. Parent bird sitting on young; young larger and feathered tracts further developed since yesterday.

May 28. Visited nest. Young appreciably larger since yesterday. Primaries and secondaries now good sized "pin" feathers. Feathers of dorsal area fairly well developed. White, fluffy feathers on sides of breast and flanks of considerable length. Less down.

May 30. Visited nest. Further development of young

since yesterday noticeable. Feathers show still more distinctly; less down. Young more vivacious, chirping when I took them out of the nest to examine them. Both parents present.

May 31. Visited nest. Young further developed since yesterday. The remiges have broken out of the follicles. Only slight trace of down remaining. This is confined to the crown and to the dorsal area. Feathers of ventral tract fluffy in appearance and well developed.

June 1. Visited nest. Young further matured; well feathered; very slight trace of down; parents present. Young fed at intervals of five or ten minutes.

June 2. Nest visited, but the young have vacated it. A search of the neighborhood revealed them among the high grass some 150 yards distant. They are able to fly a few feet at a time. Parents continue to feed them.

To summarize, the following positively established results are apparent: Length of incubation (dating from the laying of the last egg of the set), thirteen (13) days; young in nest, after hatching, ten (10) days.

A BIRD NEW FOR OHIO.

BY LYNDS JONES.

Mr. Irving A. Field, a student in Dennison University, Granville, Ohio, reports the capture of a European Widgeon (*Mareca penelope*) on the Licking Reservoir, March 29, 1902, by Mr. Peter Hayden, of Columbus, Ohio. The specimen was given to Mr. Field, and is now in the collection of Dennison University. The frequent occurrence of this Old World form in the eastern part of this country makes it a possible visitor to any of our inland lakes. This record for central Ohio fills a considerable gap in its inland distribution.

THE WILSON BULLETIN.

A Quarterly Magazine Devoted to the Study of Living Birds.
Official Organ of the Wilson Ornithological Chapter of the Agassiz Association.

Edited by LYNDS JONES.

Published by the Chapter at Oberlin, Ohio.

SUBSCRIPTION RATES.

Price in the United States, Canada and Mexico, FIFTY CENTS a year, FIFTEEN CENTS a number, postage paid.

Price in all countries in the International Postal Union, SIXTY-FIVE CENTS a year, TWENTY CENTS a number.

Subscriptions may be sent to Lynds Jones, Oberlin, Ohio, or to Mr. Frank L. Burns, Berwyn, Penn., or to Mr. John W. Daniel, Jr., 3146 Q street, N.W., Washington, D. C.

EDITORIAL.

The editor received a very pleasant call from our fellow-member, Benj. T. Gault, of Glen Ellyn, Ill., on May 7th. His arrival was just in time for the annual "All Day with the Birds," in company with Rev. W. L. Dawson, and the reader can imagine how the day was spent when three such bird lovers were together. In the next number of THE BULLETIN there will be an account of the day's doings.

The northern Ohio warbler migrations have been unprecedented in the numbers of individuals which have visited the region, and in the length of the visits paid by each. There can be no doubt that the weather was the chief factor in this visitation. The last days of April were not favorable to much movement, but the first eight days of May proved almost everything desired for the moving birds. Just when the warbler wave was at its height the north gave us cold, wet weather, with northerly winds, which continued until the 17th almost without a shade of relief. Nothing seemed to dare the northward journey during these days. Their numbers may be guessed from the record of 22 species on May 7th.

We believe that many persons would be interested both in our organization and in our BULLETIN if their attention were called to them. The editor will be glad to furnish sample copies of the BULLETIN and send printed matter to all whose names and addresses may reach him. We should have a hundred active members, at least, and an unlimited number of associate members, representative of the whole country, in order to do the work which we want to do. A personal campaign in the interest of the Chapter and BULLETIN by every present member would result in great benefit to all in the matter of increased facility for good work, and in the possibility for improvements in the BULLETIN. Shall we not all work to this end?

The editor has enjoyed two very pleasant vacations for the sole purpose of studying the birds. The first one was a day with Mr. Benj. T. Gault, of Glen Ellyn, Ill., and Rev. W. L. Dawson, of Columbus, Ohio, on an "All Day With the Birds" in Lorain county, Ohio, being the fourth of its kind for this wonderfully favored region ornithologically. The second vacation was of more significance, being one of a series of studies planned for the purpose of determining what are the resident birds of some of the more interesting and relatively little known places in Ohio, in preparation of a revised catalogue of Ohio birds which is being prepared under the direction of the Ohio State Academy of Sciences. The work occupied three days at the Licking Reservoir, some 30 miles east of Columbus, Ohio. There were in this company Mr. Irving A. Field, a student of Dennison University, Granville; Mr. E. J. Arrick, of McConnellsville; Rev. W. L. Dawson, of Columbus, and the editor. The region is a rich one, and the work deserves special mention in a later number.

Returns from the request for notes upon the migrations for March were too meagre to permit of a report. If such a report is to be of any value it must comprise representative localities not farther apart north and south than every degree of latitude, and east and west both in the regular streams of migration and between such places. It is not enough to know the rate at which birds travel along their regular highways. We know that pretty well already in general. If the migrations away from those highways are only a spreading from them as a center, or if they are the result of an independent movement, we want to know it. The past spring has been unusually favorable for recording unusual warblers, and for studying the warbler host in general. There can be little doubt that the favorable conditions were caused by the weather rather than by any unusual numbers of the different species. This assumption could be verified or disproved if reports from many different places in Ohio and the adjoining states and Ontario were available for comparison. Studies so strictly local are of far less value standing by themselves than if taken with a large number of other local studies for adjoining regions. Can we not combine our efforts to learn more about the migrations by sending such records as we have to some one who can study them for a final report? The editor has volunteered his services, but he would be glad to turn the work over to another if any one will volunteer to do it. Is there such an one?

ELECTION OF NEW MEMBERS.

The following applications for active membership were received before the April election, but after the last BULLETIN was mailed. If there be no objection these persons may be considered as received into active membership:

W. E. Saunders, 352 Clarence street, London, Ontario.
Wm. J. Mills, Box 16, East Point, Ga.
Miss Adelaide Utter, Clerk U. S. Circuit Court, Kansas City, Mo.
Mrs. Olive Thorne Miller, 827 DeKalb avenue, Brooklyn, N. Y.
Miss Rebecca Leete, North East, Pa.
Clarence Morrison Brooks, 105 West street, Keene, N. H.

The following persons make application for associate membership:

Jane L. Spencer, 239 East First street, Oswego, N. Y.
Harry B. McConnell, Cadiz, Ohio.
Mrs. C. J. Hunt, Harris Cottage, Lakewood, N. J.
Irving A. Field, Box 510, Granville, Ohio.
Charles E. Slocum, M D., Defiance, Ohio.

NOTES.

BOULDER, COLORADO, BIRDS INCREASING.—Owing to various causes, birds are noticeably increasing in numbers at Boulder. This is especially true of the Mountain Bluebird (*Sialia arctica*) and the Western Robin (*Merula migratoria propinqua*). It is not uncommon to see 100 robins at a time in the orchard covering half a block of ground, at the rear of my home, in the early morning. It seems to me, as others have often noticed, that the House Finch (*Carpodacus mexicanus frontalis*) is becoming more numerous each year; and this year I have seen more Juncoes of various species than usual. It must be regretfully added that the most disliked European importation, *Passer domesticus*, has reached Boulder during the past few years and is rapidly spreading its numbers over the city.—JUNIUS HENDERSON.

LAKEWOOD, N. J., April 18, 1902.—Clear. Wind west. 52°. 9 to 12 A. M. In a meadow back of the farm a pair of Bluebirds were gathering nesting material and loving each other. They flew straight to a tree which had a large shallow hole and entered it. When they flew away I examined the tree and found a beautiful nest almost finished. Further on a Tufted Titmouse responded to my whistled call. In an apple orchard Goldfinches were singing loudly, with Robins and Chipping Sparrows. A mile beyond, in the cemetery, a pair of Robins were building a nest in a pine tree, and a pair of Pine Warblers were building on a projecting pine branch. The nest was about fifteen feet from the ground, on the very tip end of the branch. I watched a long while with field glass while both birds brought feathers and soft wisps of dead grass. The nest was deep, cup-shaped and as large as a breakfast cup, very soft and downy looking, with many white feathers.

Still another mile along the Freehold road, to the farm on the hill, and away from the road to the right, down to the foot of the hill, I went through the swamp where the farmer had cut off all the wood and brush, leaving the beautiful moss and arbutus and the pitcher plants to die from exposure to sun and heat. Field and Song Sparrows were there, and I flushed three large, fat Ruffed Grouse which went off with a noise of low thunder. Suddenly came the loud clear whistle of a bird that I knew well, but heard for the first time this spring. I whistled in answer and he soon came where I could see him, for he is a very inquisitive little fellow. Sure enough, it was the Carolina Wren. No mistaking that erect tail and the quick, nervous body as he peers at the impudent intruder of his wooded retreat. But he doesn't linger long for you to observe him, but darts away with another burst of joyous song selected at random from his great variety, rich and melodious. He is a difficult bird to see near enough to study the markings, but he responds readily to the whistled call, and may sometimes be induced to remain quiet long enough to make a good study. While I was trying to coax him back again a rapid drumming on a tree behind me made me turn in that direction to discover a big, red-headed woodpecker. On going nearer it proved to be a Yellow-bellied Sapsucker busy on a thrifty tree extracting sap. Over the treetops sailed a Sharp-shinned Hawk. I got a good view of him before he sailed higher and higher in small circles into the sky.—NELLIE H. HUNT.

PUBLICATIONS RECEIVED.

BIRDS OF OREGON, ANNOTATED LIST OF THE. By A. R. Woodcock. Bulletin No. 68 of the Oregon Agricultural Experiment Station. January, 1902. Corvallis, Oregon.

This annotated list of 333 species of Oregon birds was compiled by Mr. Woodcock for the degree of Master of Science, under the direction of the professor in charge. A frontispiece of "The Denny Pheasant," two pages of Introduction by the professor in charge, and a page of acknowledgments by the author, are followed by the list of species which are more or less annotated. We are forced to the conclusion that the author has made little use of the editorial blue pencil both in the compilation of the list of species and in the selection of annotations. It is not easy to throw out records which may be questionable without giving offense, unless there be a definite statement as to what shall constitute an accepted record. For any species about which there could be a question, it is fair to require the evidence of a specimen to prove the validity of the species as belonging to the state fauna. Anything less than this is likely to lead to error. Hypothetical lists are always convenient for questionable records.

It may not seem quite fair to expect everybody to keep in touch with our rapidly shifting nomenclature, but we cannot help suggesting that a list dated 1902 might well contain the revisions of the check-list made a year before the list appeared.

We trust that this list is preliminary to a more carefully prepared one soon to follow.—L. J.

THE MISSION OF THE BIRDS. By Clarence Moores Weed. Nature Study Leaflet No. 2, New Hamshipre College Agricultural Experiment Station. April, 1902.

This 12-page illustrated leaflet is pretty clearly intended for the teacher of children, and is therefore full of directions for the instruction of the children in nature study, but particularly the study of birds. This text is largely explanatory of a diagram on the second page which sets forth graphically, on a plan of grouping, the insects which molest all sorts of vegetation under all sorts of conditions, and the birds which feed upon the insects. This chart is well conceived and clearly done, and, with the accompanying text and illustrations, makes a distinct contribution to the pedagogical side of Ornithology.—L. J.

List of Generic Terms Proposed for Birds During the Years 1890 to 1900, Inclusive, to which are Added Names Omitted by Waterhouse in his "Index Generum Avium." By Charles W. Richmond. From the Proceedings of the U. S. National Museum, Vol. XXIV., pages 663–729.

Amateur Sportsman, The, Vol. XXVI., Nos. 5 and 6, Vol. XXVII., Nos. 1 and 2.

American Monthly Microscopical Journal, The, Vol. XXIII., Nos. 3 and 4.

American Ornithology, Vol. II., Nos. 3 and 4.

Bird-Lore, Vol. IV., Nos. 2 and 3.

Birds and Nature, Vol. XI., Nos. 3 and 4.

Bulletins 130, 131, 132, 133, Ohio Agricultural Experiment Station, 1902.

Bulletins 58, 59, The Pennsylvania State College Agricultural Experiment Station, March, 1902.

By the Wayside, Vol. V., No. 1.

Cassinia, Vol. V., 1901.

Condor, The, Vol. IV., No. 3.

Journal of the Maine Ornithological Society, The, Vol. IV., No. 2.

Maine Sportsman, Vol. IX., Nos. 103, 104, 105.

Ohio Naturalist, The, Vol. II., Nos. 5, 6, 7.

Our Animal Friends, Vol. XXIX., No. 9.

Plant World, The, Vol. V., Nos. 2 and 3.

Pollination of Flowers, The. Nature Study Leaflet No. 1. New Hampshire College Agricultural Experiment Station. Review of the North American species of Athysanus. (Jassidæ.) Series 6, Nos. 14, 15, Ohio State University Bulletin, Dept. Zool. and Ent., Nos. 7, 8.

ERRATA.

Some distressing errors crept into the last number after the last proof left the editor's hands. They are as follows:

Page 7, line 12, for "scaps" read "scraps."
Page 8, line 4 from bottom, for "snipe" read "snipes."
Page 18, line 7 from bottom, for "quaked" read "quanked."
Page 22, line 15 from bottom, for "1902" read "1922."
Page 25, line 3, omit the word "no."
Page 29, line 3 from bottom, for "Ober-" read "Oberholser."